HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Rick s Pond Fall Chinook Program
Species or Hatchery Stock:	Fall Chinook (Onchorynchus tshawytscha) Hood Canal
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Hood Canal Puget Sound
Date Submitted:	August 23, 2002
Date Last Updated:	August 21, 2002

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Ricks' Pond Fall Chinook Program

1.2) Species and population (or stock) under propagation, and ESA status.

George Adams Fall Chinook (*Oncorhynchus tshawytscha*)

1.3) Responsible organization and individuals

Name(and title):	Rick Endicott, Hatchery Manager	
Organization:	Long Live the Kings (LLTK)	
Address:	1305 4th Ave. Suite 810 Seattle, WA 98101	
	P.O. Box 205 Lilliwaup, WA 98555	
Telephone:	(206) 382-9555 (Seattle)	(360) 877-6960 (Lilliwaup)
Fax:	(206) 382-9913 (Seattle)	(360) 877-9096 (Lilliwaup)
Email:	**lilli@hctc.com (Lilliwaup)**	

Name(and title):	Dr. Al Adams, Executive Director	
Organization	Hood Canal Salmon Enhancement Group (HCSEG)	
Address:	PO Box 2169, Belfair, WA 98528	
Telephone:	(360) 275-3575	
Fax:	(360) 275-0648	
Email:	**hcseg@hctc.com**	

Name(and title	Thom H. Johnson, District Fish Biologist	
Organization	Washington Department of Fish and Wildlife (WDFW)	
Address:	283236 Highway 101, Port Townsend, WA 98368	
Telephone:	(360) 765-3979	
Fax:	(360) 765-4455	
Email:	**johnsthj@dfw.wa.gov**	

Name (and title):	Ron Warren, Region 6 Fish Program Manager	
	Denis Popochock, Complex Manager	
Agency or Tribe:	Washington Department of Fish and Wildlife	
Address:	600 Capitol Way North, Olympia, WA 98501-1091	
Telephone:	(360) 204-1204	(360) 427-2214
Fax:	(360) 664-0689	(360) 427-2215
Email:	**warrerrw@dfw.wa.gov**	**popocdap@dfw.wa.gov**

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

The above listed groups are the principle parties involved with this program.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

All the yearling fall chinook production in Hood Canal is funded through the Puget Sound Fishery Recreational Enhancement Program.

1.5) Location(s) of hatchery and associated facilities.

George Adams Hatchery: Located at RM 1.0 of Purdy Cr. (16.0005), a tributary of the lower Skokomish River (16.0001) which flows into Hood Canal in southwestern Puget Sound near Union, Washington. Basin name: Hood Canal

Lilliwaup Hatchery (Long Live the Kings): Located at RM 0.6 on Lilliwaup Cr. (16.0230) near the town of Lilliwaup, Washington. Basin name: Hood Canal

Rick's Pond (Long Live the Kings): Located near the mouth of an unnamed trib (16.xxxx) of the lower Skokomish R. (16.0001) at RM 2.9 near Union, Washington. Basin name: Hood Canal.

1.6) Type of program.

Isolated harvest

1.7) Purpose (Goal) of program.

Augmentation

The goal of the Hood Canal yearling fall chinook is to provide fish for harvest opportunity within Hood Canal and Puget Sound.

1.8) Justification for the program.

This program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished by releasing yearling smolts with expected brief freshwater residency.

1.9) List of program Performance Standards .

1.10) List of program Performance Indicators."

Performance Standards and Indicators for Puget Sound **Isolated Harvest** Chinook programs.

<table>
<tr><th>Performance Standard</th><th>Performance Indicator</th><th>Monitoring and Evaluation Plan</th></tr>
<tr><td>Produce adult fish for harvest</td><td>Survival and contribution rates</td><td>Monitor catch and cwt data</td></tr>
<tr><td>Meet hatchery production goals</td><td>Number of juvenile fish released 120,000 yearlings 30,000 fingerlings</td><td>Future Brood Document (FBD) and hatchery records</td></tr>
<tr><td>Manage for adequate escapement where applicable</td><td>Hatchery return rates</td><td>Hatchery return records</td></tr>
<tr><td rowspan="7">Minimize interactions with listed fish through proper broodstock management and mass marking.
Maximize hatchery adult capture effectiveness.
Use only hatchery fish</td><td>Number of broodstock collected: None at site.</td><td rowspan="7">Stream surveys, rack counts and CWT data

Spawning guidelines

Hatchery records

Spawning guidelines
Hatchery records</td></tr>
<tr><td>Stray Rates</td></tr>
<tr><td>Sex ratios</td></tr>
<tr><td>Age structure</td></tr>
<tr><td>Timing of adult collection/spawning</td></tr>
<tr><td>Adherence to spawning guidelines</td></tr>
<tr><td>Total number of wild adults passed upstream</td></tr>
<tr><td rowspan="3">Minimize interactions with listed fish through proper rearing and release strategies</td><td>Juveniles released as smolts</td><td rowspan="3">FBD and hatchery records

FBD and historic natural outmigration times

FBD and hatchery records

CWT data, mark/unmark ratios</td></tr>
<tr><td>Out-migration timing of listed fish / hatchery fish: April through early June/May-June</td></tr>
<tr><td>Size and time of release
8 fpp (75K)/ April 15th
8 fpp (45K)/ June 1st
80 fpp (30 K) in June</td></tr>
</table>

	Hatchery stray rates	
Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines
	Hatchery-Origin Recruit spawners	Spawning ground surveys
Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks, on listed fish	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Co-Managers Disease Policy
	Fish pathologists will diagnose fish health problems and minimize their impact	Fish Health Monitoring Records
	Vaccines will be administered when appropriate to protect fish health	
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES reports

Benefits addressed:

1)Provide fish for stable, predictable fisheries.

2) Communicate within WDFW, LLTK and with the tribes, citizen groups, private citizens and federal agencies regarding program goals and production objectives.

3) Meet Endangered Species Act recovery requirements and Wild Salmonid Policy guidelines.

Risks addressed:

1) Reduce interactions between hatchery and wild juvenile fish.

2) Meet disease prevention and control standards in the Co-Manager's Salmonid Disease Control Policy.

3) Meet or exceed state and federal water-quality standards for hatchery discharge.

1.10.1) Performance Indicators addressing benefits.

1) Publish agreed-to production plans (Future Brood Document) with PNPTC tribes and other stakeholders.

2) Acquire needed permits (e.g. approved HGMP) to ensure that the Ricks' Pond Yearling fall chinook program satisfies ESA recovery requirements for listed fish.

1.10.2) Performance Indicators addressing risks.

1) Conduct monthly visits by fish health specialists, more frequent checks if needed. Complete all required fish health reports documenting compliance with the Co-Manager's Salmonid Disease Control Policy.

2) Conduct water-quality testing and report results as required by the Washington Department of Ecology to document compliance with water-quality testing.

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

To produce a release of 120,000 yearlings and 30,000 fingerlings: achieve the eggtake goal of 165,000 green eggs at George Adams Hatchery, a maximum of 94 fall chinook adults and 1 jack will need to be collected. This assumes a 10 % pre-spawning mortality, a 91% egg-to-smolt survival (Fuss and Ashbrook 1995), average fecundity of 3,500 eggs per female and a 1:1 sex ratio. Adults in excess of eggtake goals will be killed and sold.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingerling	Skokomish R. (16.0001)	30,000
Yearling	Skokomish R. (16.0001)	120,000

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Percent survival goal is 2%. For two tagged broodyears, 96 and 97, the average survival rate is .08%. This is preliminary data. See 3.3.1 for catch distribution.

The escapement levels for the last 5 years to the Hood Canal have averaged 1,112 (includes Skokomish, Hamma Hamma, Dosewalips and the Duckabush rivers).

1.13) Date program started (years in operation), or is expected to start.

Production from Rick's Pond and Lilliwaup Hatchery began with the 1996 brood chinook. Releases from Ricks ponds are supplemented with a fish transfer from the Long Live the Kings' Lilliwaup Hatchery. The transferred fish are acclimated and imprinted for 6 weeks at Ricks Pond prior to release from that site.

1.14) Expected duration of program.

Ongoing

1.15) Watersheds targeted by program.

Purdy Creek (16.0005)
Skokomish River (16.0001)

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

None

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program.

We have no information on the adult age structure, sex ratio, size range or smolt distribution and emigration timing of wild chinook in Hood Canal streams. We do not know if Hood Canal hatchery-origin fingerling and yearling fall chinook interact with wild Hood Canal chinook. Hood Canal wild chinook are thought to emigrate mainly as sub-yearlings, probably from April through early June. The summer flows in the South Fork Skokomish River may be too low to support chinook through the summer, though some areas in the Lower North Fork do have sufficient water (C. Baranski, WDFW, personal communication, March 2000). Hood Canal fall chinook spawn from mid-September through October with a peak in mid-October (WDFW and WWTIT 1994). Chinook spawning occurs in the mainstem Skokomish River, the lower South Fork Skokomish and tributaries such as Vance Creek, lower North Fork Skokomish and tributaries, and the lower reaches (below anadromous barriers) of Lilliwaup Creek, John Creek, the Duckabush, Dosewallips, Big and Little Quilcene Rivers, and the lower Union, Tahuya and Dewatto Rivers. Chinook spawning in many of these streams may be largely the result of hatchery releases.

Tissue samples of naturally-spawning fall chinook are being collected in Hood Canal streams for genetic analysis. Preliminary analysis of Skokomish basin adult spawners and juveniles suggests that the naturally-spawning chinook are largely, though perhaps not entirely, of George Adams/Hoodsport hatchery origin (memos from A. Marshall, WDFW, dated 4 May 1999 and 31 May 2000).

Because there is no specific information on wild smolt temporal and spatial distribution in Hood Canal streams, the extent to which they might interact with hatchery chinook released locally is unknown.

Hood Canal Summer Chum:

Available data have been compiled in Tynan (1997) and the Summer Chum Salmon Conservation Initiative (WDFW and PNPTC, 2000).

Puget Sound Bull Trout (South Fork Skokomish stock (WDFW 1998)):

There is little or no information on adult age class structure, sex ratio, juvenile life history strategy or smolt emigration timing. Hood Canal Ranger District (Olympic National Forest) staff recently conducted a radio-tagging study of (presumed) bull trout in the South Fork Skokomish River (Ogg and Taiber 1999). The objectives of the study were to examine seasonal migration patterns and to identify spawning grounds and spawning times. In addition, Forest Service staff have been conducting trapping, snorkeling and electrofishing surveys for bull trout in the South Fork. They believe that fluvial and resident life history forms are present. There is no evidence from their work of an anadromous life history form, though anadromous fish may be present. Sexually mature fluvial fish range from 38 to 59 cm. During the course of the telemetry study, spawning migration activity in fluvial fish began in late October when the water temperature dropped below 7°C and river flow increased. Spawning time appears to be from late October through late November. Spawning grounds have tentatively been identified in the mainstem South Fork from RM 18 through RM 23.5 and in Church, LeBar and Brown Creeks. Juvenile rearing areas include, but should not be considered restricted to, RM 19 through RM 23.5.

In general, chinook are not seen above the Gorge of the South Fork beginning at RM 7 (C. Baranski, WDFW, personal communication, March, 2000) so interactions between hatchery chinook and bull trout are not expected unless fluvial or anadromous fish, if any, move downstream into the lower South Fork or the mainstem Skokomish River.

- Identify the ESA-listed population(s) that may be <u>incidentally</u> affected by the program.

Puget Sound chinook, Hood Canal summer chum and Puget Sound bull trout

2.2.2) <u>Status of ESA-listed salmonid population(s) affected by the program.</u>

- Describe the status of the listed natural population(s) relative to critical and viable population thresholds

This has not been determined for the ESA listed population. WDFW SASSI document (1992) lists the following:

Summer/Fall chinook in Hood Canal are *healthy*.

Hood Canal summer chum stocks (WDFW and PNPTC 2000):

1. Union River, *Healthy*
2. Lilliwaup and Jimmycomelately creeks, *critical*
3. Hamma Hamma, Duckabush, Dosewallips, Big/Little Quilcene, and Salmon/Snow Creek, *Depressed*

Puget Sound bull trout in Hood Canal are *viable*.

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

No estimates of productivity are available for Puget Sound chinook or for Puget Sound bull trout in the Hood Canal region.

No good estimates of Hood Canal summer chum productivity are available because age data are not available. Recruit-per-spawner estimates done by WDFW, the NWIFC and PNPTC range from 1.5 to 1.8, but none of these are reliable at present (J. Ames, WDFW, personnel communication, February 2000).

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Table X. 1988-1998 spawner abundance data for Hood Canal fall chinook, Hood Canal summer chum and Lake Cushman bull trout/Dolly Varden. Chinook data are from the 1999 WDFW chinook run reconstruction. Summer chum data are from J. Haymes (WDFW, personnel communication). Bull trout data are from WDFW (1998) through 1996 and from D.Collins (WDFW, personnel communication) thereafter.

Year	Fall Chinook	Summer Chum	Bull Trout/Dolly Varden
1988	2,772	2,967	152
1989	1,425	598	174
1990	724	429	299
1991	1,858	746	299
1992	940	1,954	285
1993	1,172	712	412
1994	1,072	2,050	281
1995	1,999	8,971	250
1996	1,028	19,683	292
1997	492	8,420	No data collected
1998	1,803	3,407	119[1]
1999	3,020	3,882	90[1]
2000	1,690	7,987	
2001	No data at this time	No data at this time	

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

The proportions of direct George Adams Hatchery-origin fall chinook and listed Puget Sound wild chinook on natural spawning grounds are unknown. Mass marking has not yet been initiated at George Adams and most George Adams fall chinook are not coded-wire tagged and adipose-fin clipped. Consequently hatchery and wild fish are often

[1] Counts were incomplete due to high water (D.Collins, personal communication, February, 2000)

indistinguishable on spawning grounds. However, in recent years hatchery-origin chinook, identified by adipose-fin clips and scale patterns, have been recovered from spawning grounds in the mainstem Skokomish River during sampling for genetic analysis. In 1998, 61 chinook spawners were sampled, ten of which were coded-wire tagged. They originated from George Adams hatchery (n=3), Hoodsport Hatchery (n=2), Long Live the Kings releases from Rick's Pond (n=4) and the now-defunct Sund Rock net pens (n=1). Seven of these fish had been released as yearlings and three as fingerlings. Since George Adams releases only fingerlings, the yearlings would probably have come from the Long Live the Kings project, Hoodsport Hatchery or net pens in Hood Canal. Scale analysis of the untagged adults in the genetics sample showed that an additional 16 fish had hatchery yearling scale patterns. Thus hatchery-origin fish comprised at least 43% of the sample. More fish in the sample may have been of hatchery origin, but chinook released as fingerlings would have scale patterns indistinguishable from those of wild chinook, which outmigrate mainly as fingerlings.

There is high potential for George Adams chinook released from Endicott Pond and from the now defunct net pen programs in lower Hood Canal to stray because they were released from sites to which they cannot return.

2.2.3) <u>Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take</u>

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Broodstock collection for George Adams and Hoodsport fall chinook may result in take of listed Puget Sound fall chinook through capture at the traps in Purdy and Finch Creeks from August 1 through mid-September. Entry into the trap may result in injury to listed chinook. Listed wild chinook cannot be distinguished from unmarked hatchery fish, so they cannot be returned to Purdy Creek or the Skokomish River. The principal effect of this take is to remove listed chinook from the wild spawning population. The risk of this take is unknown because we do not know how many wild chinook are likely to enter Purdy Creek and reach the hatchery trap. Contact with chinook during spawner escapement surveys (August through October), carcass recovery programs (September and October) and other monitoring and evaluation programs has a potential to take listed chinook. Care is taken to not harm, harass, or otherwise disturb chinook spawners. The WDFW contact for Hood Canal-area surveys is Thom Johnson (johnsthi@dfw.wa.gov).

Juvenile releases (see Sections 3.1 and 3.5).

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

Because hatchery-origin and listed wild chinook cannot generally be distinguished in the trap or the adult holding pond, it is not possible to reasonably estimate the take of listed chinook (if any).

Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

Annual take of listed wild Puget Sound chinook cannot be quantified since they cannot be distinguished from unmarked George Adams or Hoodsport Hatchery chinook. If listed chinook are included in the hatchery broodstock, the likely sources of take resulting from George Adams Hatchery or Hoodsport Hatchery operations are broodstock collection, injury or mortality during spawning of adults, sampling of carcasses for scales, genetic stock identification, and routine monitoring and evaluation activities, incubation and rearing, injury or mortality during egg or fry transport to school or other co-operative programs, injury or mortality during rearing in co-operative programs, injury or mortality during on-station or off-station release.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Because take levels cannot be quantified, contingency plans to limit take to pre-determined numbers have not been developed at George Adams or Hoodsport Hatcheries.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

The Rick's Pond yearling fall chinook program is conducted in a manner consistent with risk aversion measures in the Summer Chum Salmon Conservation Initiative (SCSCI) (WDFW and PNPTC 2000). Specifically, chinook are not released until after April 1 in order to reduce potential interactions with listed Hood Canal summer chum. Summer chum juveniles would be expected to migrate to salt water in February and March and then to swim seaward quickly (Tynan 1992); thus, clearing the area well before release of Rick's Pond yearling chinook in April, May and June. The SCSCI considers that both juveniles and returning adults from the on-station program pose low risk for competition or predation to summer chum.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

This HGMP is consistent with relevant standing orders and agreements. The Puget Sound Salmon Management Plan (PSSMP) and the Hood Canal Salmon Management Plan (HCSMP) are federal court orders that currently control both the harvest management rules and production schedules for salmon in Hood Canal under the *U.S. v. Washington* management framework. The parties to the SCSCI recognize that it may be necessary to modify these plans in order to implement the recommendations that will result from the SCSCI. However, the provisions of the PSSMP and HCSMP will remain in effect until modified through court order by mutual agreement

3.3) Relationship to harvest objectives.

Tribal and non-Indian commercial and recreational fisheries directed at fall chinook and other species produced through hatchery releases will be managed to minimize incidental effects to listed chinook salmon and summer chum salmon. Time and area, gear-type restrictions, and chinook and summer chum release requirements will be applied to reduce takes of listed salmon in the Hood Canal mainstem, extreme terminal marine area, and river areas where these fisheries directed at other hatchery species occur. Compliance with the fisheries management strategy defined in the SCSCI will lead to fisheries on WDFW hatchery-origin stocks that are not likely to adversely affect listed chinook or listed summer chum.

Each year, state, federal and tribal fishery managers plan the Northwest's recreational and commercial salmon fisheries. This pre-season planning process is generally known as the North of Falcon process, which involves a series of public meetings between federal, state, tribal and industry representatives and other concerned citizens. The North of

Falcon planning process coincides with meetings of the Pacific Fishery Management Council, which sets the ocean salmon seasons at these meetings.

For example, during 2000 as an outcome of the North of Falcon process, the state/tribal Puget Sound Chinook Harvest Management Plan (enclosed in letter from Billy Frank, Jr., NWIFC and Jeff Koenings, WDFW to Will Stelle, NMFS, dated February 15, 2000) contained proposals for the 2000/2001 fishing season.

For the 2001/2002 season, the co-manager's have prepared a Harvest Management Plan for Puget Sound Chinook Salmon. The Plan states specific objectives for harvest of the 15 Puget Sound management units, the technical bases for these objectives, and procedures for their implementation. The Plan assures that the survival and recovery of the Puget Sound ESU will not be impeded by fisheries-related mortality. The Plan is being submitted with the expectation that NMFS will reach a finding, based on the conditions stated in the 4(d) rule, that fisheries-related take in Washington waters is exempt from prohibition under Section 9 of the ESA. NMFS is currently reviewing the Plan.

3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

For the 1995 brood chinook released from Ricks' Pond as yearlings, the catch distribution was:

Hatchery returns:	66%
Wash. sport:	18%
Wash. net:	2.2%
Wash. troll:	3.3%
Oregon/Calif. sport:	10.5%

The state/tribal Puget Sound Chinook Harvest Management Plan (enclosed in letter from Billy Frank, Jr., NWIFC and Jeff Koenings, WDFW to Will Stelle, NMFS, dated February 15, 2000) contained proposals for the 2000/2001 fishing season. The proposed fisheries are designed to target George Adams (including Ricks' Pond) and Hoodsport Hatchery chinook while minimizing catch of wild chinook. The state/tribal FRAM for 2000/2001 fisheries projects a southern U.S. exploitation rate of <15% on mid-Hood Canal (Hamma Hamma, Duckabush and Dosewallips) wild chinook and <15% southern U.S. pre-terminal exploitation rate on Skokomish wild chinook. Final estimated southern U.S. exploitation rate on mid-Hood Canal wild chinook was 12.4% in FRAM run # 0700 dated 4-6-2000 (T Johnson, WDFW, personal communication).

3.4) Relationship to habitat protection and recovery strategies.

Hood Canal chinook: Limiting factors analyses have not been completed for Hood Canal natural chinook stocks and factors for decline and recovery are not available. However, since listed chinook and listed summer chum utilize similar habitats, habitat protection and recovery strategies designed to recover summer chum (see below) will also aid in the recovery of listed Hood Canal chinook.

Summer chum : Summer chum supplementation, habitat restoration and management measures are integrated as presented in the Summer Chum Salmon Conservation Initiative (WDFW and PNPTC 2000). The SCSCI provides a standardized approach to determine freshwater and estuarine limiting factors in each summer chum watershed. Habitat factors for decline and recovery for each watershed are described. In addition, at the summer chum ESU scale, protection and restoration strategies for each limiting factor for decline are provided. The goal of the habitat protections and restoration strategy is to maintain and recover the full array of watershed and estuarine-nearshore processes critical to the survival of summer chum across all life stages.

Bull trout: Bull trout in the Hood Canal region are found in the South Fork Skokomish, Lake Cushman and the upper North Fork Skokomish above Staircase Falls. The condition of the South Fork is poor, as mentioned above. Lake Cushman is now a reservoir, and the water level in the one-half mile of the North Fork Skokomish just above the reservoir fluctuates too much to provide stable spawning habitat. Further, the upper and lower Cushman dams have eliminated the anadromous life history form from the North Fork. However, most of the North Fork above Lake Cushman is in the Olympic National Park, and the Habitat is essentially pristine.

Other Habitat Protection Efforts and Probable Benefits:

Habitat protection efforts include the Northwest Forest Plan, adopted by the Forest Service and the Bureau of Land Management in the Northwest in 1994. The plan requires increased stream buffers to protect stream habitat for salmonids and limits road construction and some forms of logging on steep/unstable slopes. Most of the Olympic National Forest is in Late Successional Reserves which limits logging to thinning in stands under 80 years old and severely limits or prohibits logging in older stands. The Forest Service is updating road inventories and embarking on a long-term program to improve or close some of the roads which pose the greatest threats to slope stability and streams. Within Washington State, the Forests and Fish Report, prepared by the USFWS, NMFS, EPA, Office of the Governor of the State of Washington, WA DNR, WDFW, WA DOE, the Colville Tribes, Washington counties, and timber industry groups, was accepted by Washington Legislature in 1999. The emergency forest practices rules which were developed from the Report will result in some improvements in state and private forest land management including increased stream buffers and some reduction in logging in riparian areas and unstable upslope areas. Both the federal and state and private forest plans will result in habitat improvements, but are far from ideal for fish. The resulting improvements in fish habitat, such as increased large woody debris in streams, may not be realized for decades given the very poor current conditions of many fish-bearing streams and their riparian areas.

The George Adams Hatchery is making a modest contribution to habitat improvement by donating fish carcasses which cannot be donated to food banks or sold to a contracted buyer to an Olympic National Forest Service (Hood Canal District) crew which places the carcasses in streams and riparian areas for nutrient enhancement. In 1997 and 1998, a total of nearly 1,500 George Adams fall chinook were donated to the nutrient enhancement program.

3.5) Ecological interactions.

Summer Chum: The SCSCI provides an assessment of risks to summer chum juveniles and adults posed by the production of George Adams and Hoodsport fall chinook chum, risk averse measures to implement, and monitoring and evaluation measures to be applied to minimize any risks.

Fall Chinook: Risks and benefits posed by hatchery-origin juvenile and adult chinook to wild juvenile and adult chinook will depend on the number, size, release time and stream residence time of the hatchery fish. George Adams releases approximately 3.8 million fingerling smolts annually and production will be managed to minimize potential adverse effects to listed fall chinook.

Competition and Predation: George Adams and Rick's Pond smolts are expected to migrate quickly to Puget Sound, however their actual stream residence time and freshwater competition between them and wild Skokomish-basin chinook have not been examined. These smolts are released at a size of about 80 to 100 mm in May when wild Skokomish smolts are expected to be about 60 to 80 mm long (D. Seiler, WDFW, personal communications, February, 2000). The USFWS (1994) has suggested that juvenile salmonids can consume fish which are one-third or less their own body length. Given this rule of thumb and approximate sizes of hatchery and wild fish at the time George Adams and Rick's Pond chinook are released, predation by hatchery smolts is not expected to be a significant problem (see Section 3.1).

The numbers of wild chinook smolts have been estimated for the Skokomish basin and all of Hood Canal and are compared with numbers of hatchery chinook released in the table below.

Table 22. Comparison of wild and hatchery chinook smolts in the Skokomish River and in all of Hood Canal. Hatchery chinook include those released from George Adams, Hoodsport, the Hood Canal Salmon Enhancement Group, Long Live the Kings, co-op groups and schools. Numbers for the Skokomish permit a direct comparison of wild production with George Adams and enhancement group releases.

Area	Wild Smolts[1]	Hatchery Smolts	Hatchery Yearlings
Skokomish	104,400	3,830,000	120,000
Hood Canal	132,000	3,310,000[2]	250,000

[1]Wild smolt numbers were estimated by averaging the 1995-1998 wild escapements in Hood Canal, halving that number to estimate the number of female spawners, applying a fecundity of 4,000 eggs per female (Bill Tweit, WDFW, personal communication) to estimate the total number of eggs produced, then applying a freshwater survival rate of 5% (Bill Tweit, WDFW, personal communication) to the egg estimate to estimate the number of surviving smolts.

[2]Includes 200,000 chinook released into Big Beef Creek by the University of Washington, 110,000 chinook released into the Hamma Hamma and 3,000,000 fingerlings released into Finch Creek by WDF&W.

The Species Interaction Working Group (SIWG) (1984) categorized various risks to wild salmon species and steelhead from hatchery-origin salmon species and steelhead. Their assessment of risks to wild chinook from hatchery chinook are summarized below.

Table. Risks posed by hatchery-origin chinook to wild chinook. Data from SIWG (1984).

Type of Risk	Level of Risk
Freshwater predation	Unknown
Freshwater competition	High potential
Early marine predation	Unknown
Early marine competition	High potential

The high risk of competition assumes significant temporal and spatial overlap between hatchery and wild juvenile chinook and increases when numbers of hatchery fish released are far larger than numbers of wild fish (SIWG 1984). We have no information on hatchery-wild overlaps in the Skokomish basin or in the waters of Hood Canal. Clearly the number of juvenile hatchery chinook greatly exceeds the estimated number of wild juveniles in the Skokomish basin and throughout Hood Canal which may increase the risk of competition or attraction of fish and avian predators.

Releases of hatchery chinook may confer some benefits to wild chinook. The George Adams hatchery fry released by the Skokomish tribe may serve as food for out-migrating wild fish. If hatchery and wild chinook juveniles occupy the lower Skokomish and the same areas of Hood Canal at the same time, the large excess of hatchery fish may provide wild chinook with some protection from fish and avian predators.

Behavior modification: If large numbers of hatchery chinook are released into watersheds containing younger and/or smaller wild juveniles, they can stimulate premature out-migration in wild fish via a Pied Piper effect (Hillman and Mullan 1989). Premature out-migration can reduce survival of wild fish because they would be smaller than normal size, making them more vulnerable to predation, and they may not have completed the physiological changes required to adapt to life in salt water. We do not know if this is a concern in the Skokomish basin.

Disease Transmission: The George Adams Hatchery operates under a standing NPDES permit that limits discharge effects on the environment, and requires monitoring of effluent for settleable and suspended solids. Adherence with the NPDES permit will likely lead to no adverse effects on water quality from the program on listed fish. It is possible that hatchery fish which have been infected by transmissible pathogens or effluent from hatcheries with sick fish could infect wild fish. Hatchery effluent is not tested for pathogens, so we do not know if George Adams is releasing pathogens into the environment. However, disease transmission from hatchery to wild fish does not appear to occur routinely, possibly because pathogen spread does not occur as readily in less crowded wild fish as in hatchery fish (Tynan 1999).

Adult Interactions: The ecological interactions between wild and hatchery adult chinook which are of special concern are competition for spawning areas and competition for mates. We have no specific information on possible competition. We know (see Section 2.2.2 above) that George Adams chinook do stray onto wild spawning grounds in the Skokomish basin, however, we do not know to what extent they compete with wild chinook.

Bull Trout: We have no information on interactions between George Adams chinook and wild bull trout in the Skokomish (the only watershed in the Hood Canal currently known to have native char). The risk of competition between hatchery chinook juveniles and bull trout is unknown. Presumably competition can occur where wild and hatchery fish overlap, and space or food are limiting, but juvenile distribution of bull trout in the South Fork Skokomish is not known in detail. South Fork Skokomish bull trout are found overwintering as far down as the confluence with the North Fork (L. Ogg, USFWS, Hood Canal Ranger District, personal communication, February, 2000) but whether they overlap with George Adams chinook when these fish are released in May is unknown. Predation risks to bull trout from hatchery chinook are likely to be low, since the smallest native char juveniles are likely to be found in the uppermost portions of the Skokomish watershed. By the time South Fork fluvial or possibly anadromous char reach lower river reaches where they are more likely to overlap with hatchery juveniles, they may be too large to be preyed upon. Spawning grounds of South Fork bull trout have not been identified in detail, but are unlikely to overlap with those of fall chinook, so competitive interactions on spawning grounds are unlikely to occur.

Bull trout from the North Fork Skokomish (Lake Cushman and Upper North Fork stocks) are unlikely to pass through the hydropower projects to interact with George Adams chinook.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Lilliwaup Hatchery: Water for Lilliwaup Hatchery comes from an unnamed spring that feeds Lilliwaup Creek. Water temperatures range from 45 to 50 degrees. Water flows average 3 CFS. Water quality is extremely good.

One group of 50,000 fall chinook yearlings is reared on spring water at Lilliwaup Hatchery from May through mid-May of the following year when they are transferred to Rick's Pond for acclimation and release, approximately June 1. An NPDES permit is not required at Lilliwaup Hatchery. Intake screens meet NMFS screening guidelines.

Rick's Pond: Water for Rick's Pond comes from an unnamed spring that feeds the lower Skokomish River (16.0001). Water flows average 2 CFS and temperatures vary from 45 degrees to 50 degrees. A group of 75,000 Hood Canal fall chinook yearlings is reared at Rick's Pond from May 1 to mid-May of the following year when they are released on-site. An NPDES permit is not required at Rick's Pond. Outlet screens meet NMFS screening guidelines.

For George Adams Hatchery water source refer to the George Adams Hatchery Chinook HGMP.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

No listed fish can access the site.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

No broodstock collected at Rick's Pond. See George Adams Hatchery Chinook HGMP.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

Juveniles are transported in tank trucks equipped with water circulation pumps and supplemental oxygen. Tanks are of various sizes.

5.3) Broodstock holding and spawning facilities.

Broodstock are not collected at Lilliwaup or Rick's Pond.

5.4) Incubation facilities.

Eggs incubated at George Adams Hatchery. See George Adams Chinook HGMP.

5.5) Rearing facilities.

George Adams Hatchery: The yearling portion of the Hood Canal fall chinook program at George Adams is started and reared with the fingerling portion of the program until tagging is necessary. Then the population for the yearling program is set aside in a standard raceway.

Lilliwaup Hatchery: The yearling fall chinook are reared in 8- 20 ft. circular ponds.

Rick's Pond: This is a dirt-bottomed release pond. The first group of fall chinook is reared in this pond from May 15 through release on April 15 of the following year. The second group is transferred in from Lilliwaup Hatchery and reared from April 15 until their scheduled release on June 1.

5.6) Acclimation/release facilities.

Rick's Pond: The first group of yearlings (75,000) is reared short-term at George Adams, then transferred to Rick's Pond around May 15 where they are reared until release around April 15 of the following year. The second group of yearlings (50,000) is reared short-term at George Adams, then transferred to Lilliwaup Hatchery. They are reared there until April 15 when they are transferred to Rick's Pond. They are held at Rick's Pond until June1 to imprint them on the water source at Rick's Pond prior to release.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

None.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Lilliwaup Hatchery has a backup water supply in the event that they lose their main water supply. There is no backup water supply at Rick's Pond.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

George Adams fall chinook originated in 1961 from the Hoodsport Hatchery stock. The Hoodsport stock was started in 1952 with a release of Dungeness spring/summer chinook. This was followed by several years of Green River stock (Green River) releases until the stock became self sustaining. Additional inputs include chinook from Tumwater Falls (largely derived from Green River stock), Voights Creek (Puyallup basin), Big Beef Creek, Minter Creek and Trask River, Oregon hatchery populations. The actual contribution of these hatcheries stocks to the George Adams/Hoodsport stocks is unclear. Genetic analysis of the Hoodsport population showed similarities to the Marblemount (Skagit) Hatchery fall chinook population, which may reflect the mixed origin of both populations.

George Adams stock shall be used to meet the program needs of the RFEG (Ricks Pond) yearling releases.

6.2) Supporting information.

6.2.1) History.

The Green River fall chinook stock originated from adults collected in the Green River. The stock was propagated at the Soos Creek Hatchery and disseminated widely throughout Puget Sound hatcheries. The hatchery began operation in 1901.

Dungeness chinook are a spring/summer stock native to the Dungeness. They were not successfully introduced at Hoodsport and may not have contributed significantly to the George Adams/Hoodsport stock.

The Voights Creek stock originated from Voights Creek chinook but had significant infusions of Green River stock. The Minter Creek fall chinook stock is a Green River derivative. The Trask River chinook stock were derived from native Tillamook Bay stocks. These fish were incorporated into the Hoodsport stock because they tend to be large. Trask River stock apparently did not prosper.

There have not yet been three consecutive generations of chinook releases from George Adams based solely on adult returns to the hatchery. There are frequent egg transfers from Hoodsport Hatchery if George Adams fails to make its eggtake goal. Consequently, the George Adams stock is considered introduced and not locally adapted at George Adams. A genetic analysis of George Adams chinook was done during 1999 and no significant differences were found overall between George Adams and Hoodsport hatcheries. It did appear that Hood Canal area populations formed a group differentiated from south Puget Sound populations, although at a relatively low level. This is noteworthy given the history of stock transfers between the two years (memo from Anne Marshall, WDFW, 31 May 2000) and may indicate local adaptation is occurring in the Hood Canal hatchery stocks.

No intentional selection for any characters such as size or run timing has been conducted. In most years, insufficient chinook return to the hatchery to achieve the eggtake goal (5.72 million eggs), so nearly all chinook returning to the hatchery are spawned and it is unlikely that any consistent inadvertent selection has occurred.

6.2.2) Annual size.

95 adults are needed to satisfy the egg take for the program.

6.2.3) Past and proposed level of natural fish in broodstock.

Unknown in the past.

6.2.4) Genetic or ecological differences.

Unknown

6.2.5) Reasons for choosing.

The George Adams Hatchery broodstock is the closest available stock and was selected for that reason.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

Not applicable.

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults from the George Adams Hatchery shall be used to effect this program. The collection of localized hatchery-origin broodstock at this location will limit direct and incidental take effects on listed chinook salmon.

7.2) Collection or sampling design.

See George Adams Chinook HGMP.

7.3) Identity.

Unmarked hatchery-origin chinook cannot presently be distinguished from wild fish.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

No broodstock collected at Rick's Pond.

Broodstock for this program is collected at George Adams. To produce a release of 120,000 yearlings and 30,000 fingerlings from 165,000 green eggs at George Adams Hatchery, a maximum of 94 fall chinook adults and 1 jack will need to be collected.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Year	Adults Females	Males	Jacks	Eggs	Juveniles
1988	N.A.				
1989	N.A.				
1990	N.A.				
1991	N.A.				
1992	N.A.				
1993	N.A.				
1994	N.A.				
1995	N.A.				
1996	N.A.				
1997	N.A.				
1998	N.A.				
1999	N.A.				
2000	NA				
2001	NA				

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

All returning fall chinook are trapped at George Adams Hatchery. See George Adams Hatchery Chinook HGMP.

7.6) Fish transportation and holding methods.

George Adams and Hoodsport adult chinook are not generally transported. When they are, hauling is carried out using WDFW loading rate guidelines which specify densities for salmon of different species and sizes, salinity and disinfection procedures (WDFW undated).

7.7) Describe fish health maintenance and sanitation procedures applied.

NA

7.8) Disposition of carcasses.

See George Adams Chinook HGMP.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

See George Adams Chinook HGMP.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

No broodstock collected at Rick's Pond. See George Adams HGMP.

8.2) Males.

NA

8.3) Fertilization.

NA

8.4) Cryopreserved gametes.

NA

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

NA

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. egg to smolt survival) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

No eggs taken at Rick's Pond.

9.1.2) Cause for, and disposition of surplus egg takes.

NA

9.1.3) Loading densities applied during incubation.

Eggs incubated at George Adams Hatchery. See George Adams Chinook HGMP.

9.1.4) Incubation conditions.

NA

9.1.5) Ponding.

NA

9.1.6) Fish health maintenance and monitoring.

See George Adams Hatchery Chinook HGMP.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Not applicable.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available..

Not available. New program

9.2.2) Density and loading criteria (goals and actual levels).

In general, loading and density levels conform to standards set forth in Piper, et al., 1982.

9.2.3) Fish rearing conditions

Release ponds cannot be cleaned. Pond flows are measured weekly and feed levels adjusted accordingly. Mortality is removed daily and screens are cleaned daily. Maximum and minimum temperatures are also measured daily. Loadings are kept at or below standards set forth in Piper, et al., 1982.

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Fish are weight sampled weekly and feed rates are adjusted to provide a proper size and time of release.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

No information available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

George Adams and Rick's pond fall chinook yearling program fish are started on BioDiet Starter and switched to BioDiet Grower. Manufacturer recommendations are followed regarding when to switch pellet sizes. Feed is fed by hand. Daily feeding frequency is gradually decreased from 5 times per day at ponding to 1 time per day/5 days per week at release.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

See 9.1.6

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

Physical appearance and behavior are used to judge smolt development.

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

NA

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

NA

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels. The program shall be limited to 120,000 yearlings to help retain, and not forestall, potential future options for the recovery of the listed chinook ESU.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling	30,000	80	June	Skokomish River
Yearling	75,000 45,000	8 8	April 15 June 1	Skokomish River Ricks Pond (16.0001) ditto above

10.2) Specific location(s) of proposed release(s).
Stream, river, or watercourse:)
Major watershed:
Basin or Region:

Skokomish River (WRIA 16.0001). RM 2.9, Skokomish watershed, Hood Canal Region (Rick's Pond). The fish are released in the extreme lower reaches of the Skokomish River.

10.3) Actual numbers and sizes of fish released by age class through the program.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995								
1996								
1997								
1998							195,000	8 fpp
1999							175,000	8 fpp
Average							185,000	8 fpp

10.4) Actual dates of release and description of release protocols.

At Rick's Pond both groups of fall chinook yearlings are released at night. The first group of fish are released in mid-April. The second group, transferred from Lilliwaup, is released on June 1 after a 6 week acclimation period.

10.5) Fish transportation procedures, if applicable.

The portion of the yearlings which are reared at Lilliwaup are transported to Rick's pond in tank trucks equipped with water circulation pumps and supplemental oxygen.

10.6) Acclimation procedures

At Rick's Pond fish reared and transferred from Lilliwaup Hatchery are held for 6 weeks in order to imprint them to the release site.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

Ricks Pond releases: 1996 and 1997 broods 100% Ad+CWT'd
1998 and 1999 broods no marks

With co-manager agreement, WDF&W will apply an identifiable mark to 100% of the fall chinook production released through the George Adams, Hood Canal and Recreational Enhancement Plan (REP) (Ricks pond) hatchery programs each year to allow monitoring and evaluation of the hatchery program fish releases and adult returns. WDFW shall, as a management intent, coded-wire tag of a portion of the fall chinook production to allow for evaluation of fishery contribution, survival rates and stray levels to other Puget Sound watersheds.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

There are not likely to be a significant number of surplus fish as they will have been inventoried on several occasions earlier in their life history. In the event of an unforseen surplus, surplus fish will be disposed of in consultation with the co-managers and NMFS.

10.9) Fish health certification procedures applied pre-release.

Each lot of fish is examined by a WDFW Fish Health Specialist prior to release or transfer, in accordance with the Co-Managers Salmonid Disease Control Policy.

10.10) Emergency release procedures in response to flooding or water system failure.

In the event of a water system failure, screens would be pulled to allow fish to exit the pond. In some cases they can be transferred into other rearing vessels to prevent an emergency release. WDFW also has emergency response procedures for providing back-up pumps, transport trucks, etc. in cases of emergency. In cases of severe flooding the screens are not pulled because flood waters rise to the point where they breach the ponds. Past experience has shown that the fish tend to home down to the bottom of the pond and only those that are inadvertently swept out are able to leave.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

The yearlings released from Rick's Pond are released in the lower Skokomish River decreasing the likelihood of interaction with naturally-produced fish in the Skokomish River system.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of Performance Indicators presented in Section 1.10.

Note: See section 1.10 for Monitoring and Evaluation. The purpose of a monitoring program is to identify and evaluate the benefits and risks which may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

Each production group shall be identified with distinct otolith marks, adipose clips, coded wire tags, blank wire tags or other identification methods as they become available, to allow for evaluation of each particular rearing and/or release strategy. This will allow for selective harvest on hatchery stocks when appropriate, monitoring of interactions of hatchery and wild fish wherever they co-mingle in riverine, estuarine and marine habitats and assessment of the status of the target population. WDFW shall monitor the Chinook salmon escapement into the target and non-target Chinook populations to estimate the number of tagged, un-tagged and marked fish escaping into the river each year and the stray rates of hatchery Chinook into the rivers.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each Performance Indicator identified for the program.

Benefit Indicator 1: Achieve broodstock/eggtake goals to provide fish for stable, predictable fishery

At George Adams Hatchery, the maximum number of spawners needed to meet the eggtake has been determined to be 2,900 (1,450 females and 1,450 males). Because fish are not sorted by sex at the time they enter the adult pond from the trap, more than 2,900 chinook will be collected. The number of spawning days is planned in advance, based on typical return timing. The number of males and females to be spawned on each day can be determined. The risk is that the number of females will fall short of the number needed, and eggtake will be less than required.

Egg takes are estimated at the time of spawning and refined after shocking and picking.

Benefit Indicator 2: Communicate within WDFW and with tribes, citizen groups, private citizens and federal agencies regarding program goals and production objectives. Meet ESA recovery requirements and Wild Salmonid Policy requirements.

WDFW staff and PNPTC/tribal staff communicate if production changes are proposed. Production changes involving the regional fish enhancement group or volunteer co-op groups are communicated through the WDFW Cooperative Extension, Outreach and Partnership Program. The changes in goals and production levels which result from these discussions are reflected in the Future Brood Document compiled by WDFW. Recently NMFS has also become involved in discussions of changes to production at George Adams affecting the region fish enhancement program.

WDFW and NMFS are engaged in discussions of hatchery chinook production and release in Hood Canal to ensure that agency hatchery programs are consistent with recovery requirements. Aspects of hatchery physical plant and operations which may conflict with the Wild Salmonid Policy will be reviewed by WDFW staff assigned to implement the policy.

<u>Benefit Indicator 3</u>: Provide carcasses for Skokomish nutrient enhancement program.

This is an ad hoc program conducted by the Forest Service. The hatchery provides carcasses as available and needed for nutrient enhancement.

<u>Risk Indicator 1:</u> Reduce hatchery broodstock collection impacts on wild fish

In order to avoid collecting wild chinook for spawning, they must be separable from all hatchery chinook. This is currently not possible for two reasons. First, unmarked hatchery fish cannot currently be distinguish from wild fish. Second, wild fish entering the hatchery need to be identified and returned, quickly to the river. There is no system to return wild adults directly to the river.

The problem of distinguishing wild from hatchery fish could be addressed by marking all hatchery fish. The state and the PNPT tribes are discussing the need to mass mark chinook in Hood Canal. The problem of separating hatchery and wild fish once they can be identified could be solved if the adult pond could be divided and a sorter were installed at the trap or the entrance to the pond. Once wild fish can be sorted from hatchery fish, they can be returned to the Hood Canal for release. We must be aware, however, that even with mass marking, a small number of unmarked hatchery fish may return depending on the proportion of "bad clips or marks" at the time of marking.

<u>Risk Indicator 2</u>: Reduce interactions between hatchery and wild juvenile fish.

This would require monitoring of hatchery smolts following release into Skokomish River from Rick's Pond and determination of the temporal and spatial distribution of juvenile bull trout and wild chinook.

<u>Risk Indicator 3</u>: Maintain hatchery stock integrity and genetic diversity.

This requires that no chinook form outside the Hood Canal region be introduced into George Adams. It also requires also that the spawning population be sufficiently large to avoid significant effects of genetic drift and that spawners represent the entire run timing.

Risk Indicator 4: Meet disease prevention and control standards in co-managers Salmonid Disease Policy. This requires that measures prescribed for examining fish to be transferred or released be followed, that routine health inspections be conducted and that disease outbreaks be contained quickly.

Risk Indicator 5: Reduce interactions between hatchery adults and wild adult spawners on the spawning grounds.

Risk Indicator 6: Monitor discharge water quality.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

Funding and resources are currently committed to monitor and evaluate this program as detailed in the Resource Management Plan for Puget Sound Chinook Salmon Hatcheries (Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, August 23, 2002).

Benefit Indicator 1: Staff funding and manpower to count hatchery adult returns and determine eggtakes needs are available at the current level.

Benefit Indicator 2: Staff and funding are available to carry out discussions of production programs at George Adams and to make changes to the Future Brood Document to reflect those changes.

Benefit indicator 3: Staff and funding are available to provide chinook carcasses for a Forest Service crew to pick up and distribute in the watershed.

Risk Indicator 1: Funding is not currently available to construct a means of separating wild and hatchery fish at the hatchery.

Risk Indicator 2: The staff, funding and logistical support are not available to undertake monitoring of hatchery smolts, determination of the extent to which they overlap with wild fish and the effect of the overlap.

Risk Indicator 4: Disease prevention and control measures is monitored in the monthly fish health reports for George Adams.

Risk Indicator 5: WDFW shall monitor chinook salmon escapement to the Skokomish River sites to estimate the number of tagged, untagged, and marked fish escaping to the River each year. This monitoring will allow for assessment of the status of the target population.

Risk Indicator 6: At George Adams Hatchery, water quality is monitored in the monthly Discharge Monitoring Report, part of the NPDES permit reporting requirements. Production levels at Rick's Pond is below that which requires an NPDES permit.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Monitoring and evaluation will be undertaken in a manner which does not result in an unauthorized take of listed chinook.

SECTION 12. RESEARCH

12.1) Objective or purpose.

None.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached take table (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

Fuss, H. and C. Ashbrook. 1995. Hatchery Operations Plans and Performance Summaries Volume 1 Number 2. Puget Sound. WDFW Hatcheries Program, Assessment and Development Division. Olympia.

Ogg, L.W. and A.T. Taiber. 1999. South Fork Skokomish bull trout (Salvelinus confluentus) research project, summary report, 1999. U.S.D.A. Forest Service, Olympic National Forest, Hood Canal Ranger District, N 150 Lake Cushman Road, Hoodsport, WA 98548.

Piper, Robert, et. al., 1982, Fish Hatchery Management; United States Dept of Interior, Fish and Wildlife Service, Washington, DC.

Point No Point Treaty council, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife. 1996. Hood Canal salmon and steelhead production. 1996 Memorandum of Understanding.

Point No Point Treaty Council, U.S. Fish and Wildlife Service and Washington Department of Fish and Wildlife. 1986. Hood Canal Salmon Management Plan.

Seidel, Paul, 1983, Spawning Guidelines for Washington Department of Fish and Wildlife Hatcheries, Washington Department of Fish and Wildlife, Olympia

Tynan, T. 1997 Life History Characterization of Summer Chum Salmon Populations in the Hood Canal and Eastern Strait of Juan de Fuca Regions. WDFW Hatcheries Program, Assessment and Development Division. Olympia.

Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, 2002, Puget Sound Chinook Salmon Hatcheries, Resource Management Plan , a component of Comprehensive Chinook Salmon Management Plan, August 23, 2002. 103 pages.

Washington Department of Fisheries, Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. 1992 Washington State Salmon and Steelhead Stock Inventory. Olympia. 212 p.

Tynan, T. 1999. Draft risk assessment of anadromous salmonid artificial production programs within the Hood Canal summer chum ESU geographical boundary. Present practices and production, potential effects on summer chum, and proposed risk aversion and monitoring and evaluation measures. WDFW Fish Program, Salmon and Steelhead Division. Olympia.

U.S. District court of Western Washington. 1976. United States v. Washington, 384 F, Supp. 312.

Washington Department of Fish and Wildlife and Washington Treaty Indian Tribes. 1998. Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Olympia.

Washington Department of Fish and Wildlife and Washington Treaty Indian Tribes. 1999. Current Brood Document.

Washington Department of Fish and Wildlife. 1996. State of Washington Fish Health Manual. Hatcheries Program, Fish Health Division. Olympia.

Washington Department of Fisheries and Point No Point Treaty Council. 1996. Hood Canal Salmon and Steelhead Production 1996 MOU.

Washington Department of Fish and Wildlife and Point No Point Treaty Tribes. 2000. Summer Chum Salmon Conservation Initiative: An Implementation Plan to Recover Summer Chum Salmon in the Hood Canal and Strait of Juan de Fuca Region. Jim Ames, Gary Graves, and Chris Weller, editors. Fish Program, Washington. Department of Fish and Wildlife, Olympia. 423 p. + app.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.

Name, Title, and Signature of Applicant:

Certified by_______________________________ Date:_____________

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Chinook ESU/Population: Puget Sound Activity: Yearling Chinook Program				
Location of hatchery activity: Rick's Pond and Lilliwaup Hatchery (Hood Canal) Dates of activity: ongoing Hatchery program operator: WDFW , Rick Endicott, Long Live the Kings				
Type of Take	**Annual Take of Listed Fish By Life Stage** (***Number of Fish***)			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)				
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)	Unknown	Unknown		
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.